

An Overview of Environmental Medicine

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"The time has come to give the study of the responses that the living organism makes to its [diet and] environment the same dignity and support which is being given at present to the study of the component parts of the organism.... Overemphasis on a reductionist approach will otherwise lead biology and medicine into blind alleys..." [Rene Dubos]

Introduction

The current medical care model has an impressive track record of performance for helping generally well patients who get acute and self-limiting illnesses such as infectious diseases and trauma. This model has assumed for many years that good health is the natural homeostatic state of the human body. The environment is seen as an essentially benign place that generally has little effect on health, and the diet is simply a passive source of metabolic fuels for the body's inherently stable metabolic functions. Therefore, when physicians are looking for the cause of a chronic disease, this same assumption is applied, and the potential roles of the environment and diet are superficially acknowledged, but their true importance in chronic disease is neither appreciated nor effectively accommodated in actual practice.

Yet, during the past several decades, there has been a burgeoning growth in the incidence of more complex and chronic diseases in our population. Unfortunately, application of the current medical model to these diseases seems to be resulting in a rapidly increasing cost for their care, accompanied by a rapidly decreasing satisfaction with the quality of life that results from this care. In an effort to find the explanation for this unacceptable and puzzling situation, a group of clinicians from various specialties banded together in the 1960's and formed a medical society that has evolved into the American Academy of Environmental Medicine (AAEM). These physicians noted, as many have, that increased chronicity of illness and multiple organ system involvement consistently and significantly decrease response rates to treatment. They determined that such treatment failures seemed to result when too much emphasis was placed on the nature of the disease and its symptomatic treatment, and not enough attention on the causes and why the disease developed in the first place. To correct this situation, these physicians formed a new, more comprehensive, cause-oriented model for the diagnosis, treatment, and prevention of chronic disease, called the Model of Environmental Medicine.

The new model has its roots in the ancient traditions of both western and eastern medicine. In more recent times it has been influenced by research on the physiologic effects of prolonged exposure to cumulative stresses (Selye, 1946) (Randolph, 1962), by systems analysis (Bertalanffy, 1950), and chaos theory (Capra, 1996). The knowledge base used in this model is a standard composite of modern basic sciences and clinical disciplines.

The model of Environmental Medicine is based on the growing appreciation that the human body is constantly coping with its dynamic environment by means of a number of inherited, built-in, complexly interacting, and usually reversible biologic mechanisms and systems.

These systems are designed to maintain overall homeodynamic (not homeostatic) functioning among all biological mechanisms. Their ongoing adjustments are unique to the individual and change continually over time.

According to this model, substances in the diet or environment are appreciated as being potential stressors, capable of contributing to de-stabilization of homeodynamic functions, therefore causing disease. The term "homeodynamic functioning" is preferred because it reflects the fact that maintenance of health and function is an active process rather than a passive one. Categories of potential external stressors would include organic inhalants such as dusts, molds, pollens, and danders; the myriad of man made and naturally occurring chemicals; the diet and the many substances in it; infectious organisms; and physical phenomena such as radiation, heat, cold, humidity, vibrations, noise, electro-magnetic fields, etc. Categories of potential internal stressors would include psychological stresses, genetic limitations, malnutrition, dysfunctioning biological mechanisms, etc. Treatment strategies must be individualized and customized for each patient.

THE MODEL OF ENVIRONMENTAL MEDICINE

OPTIMAL HEALTH is a sustained state of optimal physical, neuro/cognitive, psychological, and social well being. It is achieved and sustained by an active, ongoing expenditure of metabolic energy to insure a homeodynamic stability of interacting biologic functions despite the dynamically changing potential for disruption from all environmental and internal stressors.

ENVIRONMENTALLY TRIGGERED ILLNESSES (ETI) are the adverse consequences that result when the homeodynamic interactions among biological functions are compromised by external or internal stressors. These stressors may range from severe acute exposure to a single stressor, to cumulative relatively low-grade exposures to many stressors over time. The resultant dysfunction is dependent on the patient's genetic makeup, his nutrition and health in general, the stressors, the degree of exposure to them, and the effects of seven fundamental biological governing principles: biochemical individuality, individual susceptibility, the total load, the level of adaptation, the bipolarity of responses, the spreading phenomenon, and the switch phenomenon.

ENVIRONMENTAL MEDICINE is the comprehensive, cost-effective, proactive cause-oriented, patient-centered and preventive strategic approach to medical care dedicated to the evaluation, management, and prevention of the adverse consequences resulting from ETI.

EVALUATION of ETI is accomplished by use of a chronological, sufficiently detailed, environmentally and diet focused history designed to accurately detect the various clinical patterns generated by the involvement of specific stressors and by the dynamic interactions resulting from the above governing principles. A positive history is then supplemented as indicated by an appropriate physical examination, laboratory testing to assess the functional status of the patient's biologic mechanisms, medical imaging techniques, diagnostic surgical techniques, and endorsed diagnostic testing techniques.

MANAGEMENT of appropriately identified ETI is by use of the endorsed treatment techniques of comprehensive patient education about the nature of the illness, correction of abnormal nutritional, metabolic, and psychological dysfunctions, immunotherapy, reasonable elimination of identified stressors, and symptomatic drugs and surgery where appropriate.

PREVENTION of ETI is achieved by the skillful proactive application of the concepts and principles of Environmental Medicine. This would include the adoption of appropriate lifestyles that specifically minimize exposures to identified stressors as much as practical, that provide less contaminated air, food, and water, and that insure ongoing optimal nutrition and metabolic functioning, and optimal physical, neuro/cognitive, psychological, and social well being.

THE ULTIMATE LONG-TERM GOAL of appropriate diagnosis and treatment is the cost-effective attainment and sustaining of optimal physical, neuro/cognitive, psychological, and social well being. This includes the return to a pre-illness level of functioning and improved tolerance to stressors that previously caused adverse reactions. Through education, patients should develop and adopt appropriate lifestyles to prevent the recurrence and development of new illnesses.

Successful Application of the Model of Environmental Medicine

The proactive and preventive strategies of Environmental Medicine are applied through a conventional sequence. This begins with a comprehensive environment and diet focused medical history, a physical examination, and diagnostic testing. It proceeds to a hypothesis of the condition's origins and concludes with an effective match between suggested treatments and a beneficial response by the patient.

There are several major requirements that must be met in order for all patients to benefit most effectively and consistently from the concepts and modalities of Environmental Medicine:

1. The physician must know how and when to supplement the current model with the Environmental Medicine model, as dictated by the needs of each patient. This involves determining when symptomatic drugs alone may be appropriate, and when it is necessary to also actively seek the actual nature of the disease with the goal of identifying and correcting its actual causes.
2. When treating acute and self-limited diseases, it is appropriate to look for fixed name disease diagnoses to guide the choosing of appropriate symptomatic drugs. The drugs may be used to buy time until the body's own homeodynamic functions recover from the acute illness, and restore health again.
3. When treating more chronic and complex illnesses, it is more useful to think in terms of identifying dysfunctions in specific biological mechanisms; for example, defects in insulin, glucose, and glycosalation control; activation of chronic pro-inflammatory pathways, etc. The goal is to repair discovered dysfunctions, in order to return the mechanisms to their homeodynamic state, restoring health.
4. The physician must be able to identify and test for the complex range of possible external and internal stressors that can contribute to ETI.
5. The physician must understand the functioning of the body's many biological mechanisms and appreciate how they all interact inextricably in the "web of life". The physician must be able to assess the functional status of these mechanisms and their interactions with appropriate tests.

6. The physician must appreciate the true complexity of the relationships between biological mechanisms and the environment and diet as they interact in health and disease. As one astute old physician put it, "Mother Nature ain't playing Checkers! She's playing Chess!"
7. In order to ascertain the causes of disease and to understand the dynamic ongoing clinical manifestations of an evolving illness, the physician must effectively apply the six fundamental biological principles of Environmental Medicine while obtaining the patient's chronological history.
8. A reasonable effective treatment plan must accommodate the patient's individual list of stressors, the functional status of biological mechanisms, the level of understanding, and the patient's resources. Treatment modalities should be those that will be the most cost effective, convenient, and efficacious for restoring the patient to good health and preventing further disease.
9. The physician must try to discover the dynamic nature of each patient's illnesses, and the must be able to teach this to the patient in a clear and useful manner. After all, the word "doctor" comes from the Latin verb "docere", which means "to teach". There is no more powerful way for the patient to control his/her chronic disease than to understand its very nature and to be able to manipulate its causes to reverse and prevent it. This will be best achieved by an ongoing and dynamic partnership between a well motivated, effectively educated patient and a physician and staff who are well trained and experienced in the discipline of Environmental Medicine.

Forms of Therapy

The most effective and cost efficient therapies will be proactive and will stress early assessments and interventions to maintain optimal physical, emotional/cognitive, and psychological health, and spiritual well being. The short term and long term forms of therapy must be customized for each and every patient, and may consist of any combination of the following categories of treatment modalities:

1. **Patient Education:** On the nature of the illness, its treatment, and on future prevention.
2. **Therapeutic Customized Diets:** Whole food diets and nutraceuticals designed to reverse specific nutritional deficiencies; to provide optimal nutrition, and to accommodate specific diet related problems such as food-born toxins, food allergies, and food intolerances, etc.
3. **Nutritional Supplements:** Vitamins, minerals, amino acids, fatty acids, and other specific nutrients provided to help correct or optimize specific biological mechanism functions such as detoxification, anti-oxidation, and anti-inflammatory pathways, etc.
4. **Immunotherapies:** Customized vaccines made up of specific inhalants, foods, chemicals, etc. May be taken by subcutaneous injection or sublingually.
5. **Psychotherapies:** Specific modalities to attain and sustain optimal neuro/cognitive, psychological, social, and spiritual well being.
6. **Detoxification Therapies:** Specific oral and parenteral nutritional protocols, heat depuration/massage/ exercise, etc. designed to detoxify indicated patients contaminated with various types of xenobiotics such as esticides, volatile organic hydrocarbons, heavy metals, etc.
7. **Environmental Controls:** Protocols to achieve clean air, water, and food by the elimination or minimization as practical of specific environmental stressors such as organic inhalants and chemicals, and physical phenomena.
8. **Pharmaceuticals:** All symptomatic drugs are routinely used as needed to provide symptomatic relief from symptoms while the underlying causes of an illness are being found and corrected. However, the potential for adverse reactions when using drugs must always be remembered.
9. **Surgeries:** Surgeries as indicated

Demographics

There are hundreds of physicians (M.D.'s and D.O.'s) who have been trained in Environmental Medicine to varying degrees by attending the continuing medical education courses of the American Academy of Environmental Medicine (AAEM). They may be found in almost any medical specialty, scattered throughout all parts of North America and Europe. AAEM has a directory of these physicians on its website at www.aaem.com. See "AAEM" in the section listing associations (below). There are also many clinicians in any specialty who have independently appreciated various aspects of

Environmental Medicine and have incorporated various insights or modalities into their practices.

Patients seeking out an Environmental Medicine approach to their chronic and complex medical problems come from all walks of life, all ages, both sexes, and many different cultural groups.

Indications and Reasons For Referral (Target Ailments)

Referral to a physician well trained and experienced in Environmental Medicine should be considered anytime a patient or his/her physician wishes to try to find the actual causes behind a chronic and/or complex illness rather than just continue to treat it with symptomatic drugs. All organ systems are commonly involved with illnesses that may respond well to the Environmental Medicine approach. See the "Office Applications" section below.

A referral might be particularly helpful if a patient's illness is chronic; consists of multiple symptoms in multiple organ systems; exhibits patterns that fluctuate over time (especially if the patterns are known to result from biological mechanisms dysfunctioning due to involvement with exposures to environmental inhalants, chemicals, or the diet); or has not responded satisfactorily to a symptomatic multiple drug approach.

Office Applications:

This list illustrates only some of the potentially extensive range of adverse health effects that have been associated with Environmentally Triggered Illnesses (ETI) as defined in this chapter. By listing a disease name here, it is not implied that it is always the result of ETI. However, the physician should be alert to the possibility and should consider evaluating the patient for an ETI connection if indicated by an appropriate history.

Where an illness does involve an ETI component, therapy to correct the contributing causes of the illness should always rank as the number one choice, ahead of any other therapy that is just symptomatic, though symptomatic therapies are appropriate adjuncts. All of the diseases and symptoms listed here are documented in the published peer reviewed medical literature to be potentially due to the mechanisms of ETI:

- **Systemic illnesses:** alcoholism, obesity, and tobacco use
- **Cardiovascular Disorders:** Migraine headaches, arrhythmias, vasculitis, thrombophlebitis, hypertension, angina, myocardial infarctions, edema and fluid retention syndromes
- **Eye/Ear/Nose/Throat Disorders:** conjunctivitis, eczema of the eyelids, blurring of vision, photophobia, laryngeal edema, Meniere's disease, recurrent otitis media, rhinitis, frequent colds, sinusitis, vertigo, hearing loss, tinnitus, and pressure in the ear.
- **Pulmonary Disorders:** Asthma, certain pneumonias, and chronic bronchitis.
- **Endocrine Dysfunction:** Thyroid dysfunction, premenstrual syndrome, fibrocystic breast disease
- **Gastrointestinal Disorders:** aphthous stomatitis, gastric and duodenal ulcers, chronic gastritis, irritable bowel syndrome, infantile enterocolitis, eosinophilic gastroenteritis, regional ileitis, ulcerative colitis, certain malabsorption syndromes, and gut flora dysbiosis
- **Hematologic Disorders:** certain anemias, thrombocytopenia
- **Genitourinary Disorders:** glomerulonephritis, nephrotic syndrome, chronic cystitis, recurrent vaginitis, enuresis, dysmenorrhea, infertility, and vulvodynia
- **Neurological Disorders:** Fatigue, certain seizure disorders, sleep disorders, Parkinson's disease, Alzheimer's disease, multiple sclerosis, and various cognitive and memory disorders
- **Neurobehavioral and Psychiatric Disorders:** attention deficit disorder, manic-depressive illness, somatoform disorders, sexual dysfunction, eating disorders, schizophrenia, panic disorders, irritability, anxiety, spaciness, and chronic fatigue
- **Rheumatologic Disorders:** lupus erythematosus, scleroderma, myalgia and arthralgia, fibromyalgia, rheumatoid arthritis, and other arthritides
- **Musculoskeletal Disorders:** muscle spasm headaches
- **Skin Disorders:** eczema, urticaria, angioedema, scleroderma, and dermatitis herpetiformis
- **Cancer**

Practical Applications

Appropriate indications and applications for both the current and the Environmental Medicine models are routinely and simultaneously found in every medical practice. A physician must know how to identify those patients who will benefit from each model, and should be able to provide all indicated care, or refer the patient out, as determined by the physician's

expertise and experience. This involves determining when simply identifying and treating a disease after the fact with symptomatic drugs may be appropriate, and when it is necessary to actively and deliberately seek the actual nature of the disease with the goal of identifying and correcting its actual causes.

A simple ranking of conditions responsive to this form of therapy is as follows. As with all alternative therapies, use of Environmental Medicine does not preclude the use of mainstream medical therapies in addition.

Top level: A therapy ideally suited for these conditions.

Asthma, cancer (adjunctive therapy), gut flora dysbiosis, irritable bowel syndrome, Meniere's disease, rhinitis, and somatoform disorders.

Second level: One of the better therapies for these conditions.

Attention deficit disorder, chronic bronchitis, chronic fatigue, dermatitis herpetiformis, dysmenorrhea, eczema, enuresis, fatigue, fibrocystic breast disease, fibromyalgia, infantile enterocolitis, laryngeal edema, migraine headaches, muscle spasm headaches, myalgia and arthralgia, premenstrual syndrome, recurrent otitis media, regional ileitis, rheumatoid arthritis, sinusitis, ulcerative colitis, and urticaria.

Third level: A valuable adjunctive therapy for these conditions.

Alcoholism, Alzheimer's disease, angina, angioedema, anxiety, aphthous stomatitis, arrhythmias, certain anemias, certain malabsorption syndromes, certain pneumonias, chronic cystitis, chronic gastritis, conjunctivitis, eating disorders, eczema of the eyelids, edema and fluid retention syndromes, eosinophilic gastroenteritis, frequent colds, gastric and duodenal ulcers, glomerulonephritis, hearing loss, hypertension, infertility, irritability, lupus erythematosus, manic-depressive illness, multiple sclerosis, myocardial infarctions, nephrotic syndrome, obesity, other arthritides, panic disorders, parkinson's disease, pressure in the ear., recurrent vaginitis, schizophrenia, scleroderma, scleroderma, sexual dysfunction, spaciness, thrombocytopenia, thrombophlebitis, thyroid dysfunction, tinnitus, various cognitive and memory disorders, vasculitis, vertigo, and vulvodynia.

**Research Base:
Evidence-Based**

There are literally dozens of books and thousands of articles in the world peer reviewed scientific literature that provide the data base about the nature of the interactions between humans and their environment in health and disease, or that provide support for the concepts and modalities as promulgated by the discipline of Environmental Medicine. The reader is referred to the Suggested Reading Section and References at the end of this chapter.

Basic Science

The information that delineates the molecular and physiological basis behind the nature of the "web of life" as used in Environmental Medicine is discussed in depth by Rea (Rea, 1992-96) and by Pischinger (Pischinger, 1991). Capra (Capra, 1996) discusses how these concepts actually apply at all levels of life on the earth.

Risk and Safety

The practice of Environmental Medicine is a strategic comprehensive approach to medical care. It is not a limited modality of therapy for one or more specific purposes. The safety and risks of its application to ill patients is directly related to the medical skills of the practitioner to proceed wisely and effectively in the evaluation and treatment, and to the severity and complexity of the patient's illness. This is true for all medical care models.

Efficacy

All illnesses whose causes include those involved with ETI will improve to some degree, within the patient's capacity to correct dysfunctioning mechanisms, if the specific causes can be properly identified and corrected as much as possible. As the physician's depth of medical knowledge and level of clinical skills in Environmental Medicine modalities increases, the treatment outcome for a wider and wider scope of applicable illnesses will improve concomitantly.

Future Research Opportunities and Priorities

Much more research is needed in this area. Such topics relate to cost-effectiveness, nutritional needs in health and disease, responses to natural and synthetic environmental chemicals, epidemiology of ETI's, and systems interactions.

Drug-Like Information

The comprehensive treatment modalities of Environmental Medicine make use of all pharmaceuticals, nutraceuticals, dietary supplements, dietary manipulations, etc. as indicated for each case. The appropriate way to use all of these substances is beyond the scope of this overview discussion.

Self-help vs. Professional

The therapies involved with Environmental Medicine range in complexity from entirely safe and simple to potentially very dangerous and quite complicated. Whether any particular therapy may be self administered or utilized only under the care of a trained health professional will be best determined by an ongoing and dynamic partnership between a well motivated, effectively educated, and responsible patient and a physician and staff who are well trained and experienced in the discipline of Environmental Medicine.

Visiting a Professional

It is very helpful to tell the patient that the Environmental Medicine physician will want to know everything the patient can remember about when, where, and under what circumstances his/her different symptoms have occurred, the order in which they have evolved, and the results of how they have been evaluated and treated up to that point, because a chronological, sufficiently detailed, environmentally and diet focused history is the most important and revealing part of an evaluation. This history may be taken by having the patient fill out a comprehensive history form before the visit, or by an interview with the physician or staff member at the first visit. The final history is then supplemented as indicated by an appropriate physical examination. A typical first visit takes from ½ to 1-½ hours. Appropriate laboratory testing to assess the functional status of the patient's biologic mechanisms (some combination of blood, saliva, urine, hair, or stool specimens), medical imaging techniques, and endorsed diagnostic testing techniques (skin tests, etc.) may be performed also at the first visit or scheduled for another time. After the physician has a complete picture about the full nature of the patient's problems, a comprehensive treatment plan will then be devised.

Subsequent management usually includes comprehensive patient education about the nature of the illness, and correction of dysfunctions by a variety of medical, nutritional, and psychological modalities. Once prescribed, the program is generally carried out by the physician's staff, with ongoing monitoring by the physician, as needed. Communication with the patient's other physicians (if any) is required in order to coordinate all care being given.

Through education, patients should develop and adopt appropriate lifestyles to prevent the recurrence and development of new illnesses. This goal will be best achieved by an ongoing and dynamic partnership between a well motivated, effectively educated patient and a physician and staff who are well trained and experienced in the discipline of Environmental Medicine.

Credentialing

The American Academy of Environmental Medicine (AAEM) feels that the most effective form of medical care based on this model can be provided by an M.D. or D.O., because these practitioners have the medical licensure to carry out all aspects of a potentially comprehensive evaluation and treatment plan. Patients should be careful to determine the credentials and professional experience of anyone from whom they seek medical advice.

Training

The American Academy of Environmental Medicine (AAEM) provides a comprehensive, ACCME-accredited Continuing Medical Education Program dedicated to train physicians in all aspects of Environmental Medicine. Its CME activities are based upon the Core Curriculum of Environmental Medicine, which is determined by the AAEM CME Committee. AAEM has different levels of membership, based upon the member's level of training in the field. There are also several non-physician categories of membership. All questions concerning AAEM and its physician education program or other functions should be addressed to the academy at its central office.

Other medical or health care provider organizations, with varying levels of accreditation, may provide educational activities about different aspects of the discipline, according to their educational goals and objectives. But only AAEM is currently providing a full and comprehensive program in this discipline, endorsed by this discipline's accrediting board, the ABEM/IBEM.

The American and International Boards of Environmental Medicine (ABEM and IBEM) are independent

organizations with two missions: [1] To grant board certification in the field of Environmental Medicine, and [2] To establish educational and training criteria for those individuals wishing to prepare themselves as Experts in the field of Environmental Medicine. Applications and other information may be obtained from the Executive Secretary of the Boards at the address below. The ABEM and IBEM are not members of the American Board of Medical Specialties.

What to Look For In a Provider

The reader may determine if any particular physician has credentials or training in Environmental Medicine from the AAEM and ABEM/IBEM by contacting these organizations. Also, AAEM has published Practice Guidelines for the Field of Environmental Medicine. Readers can call physicians and ask them about their practices and whether these guidelines are followed in their practices.

Barriers and Key Issues

There is already sufficient scientific support to warrant all physicians to at least become familiar with the concepts of Environmental Medicine and how they enhance the cost efficiency and quality of life response in the treatment of chronic complex illnesses.

However, it is difficult for physicians to embrace a comprehensive medical model that is different from what they are used to. But all physicians have the same goal for their patients: they want them to get better. Therefore, when they are aware of the credible scientific evidence to support the superior efficacy of a different way of treating the patient, they should take the time to at least become familiar with it, if not become trained to apply it in their practices. At the very least, physicians must become trained to recognize where the application of Environmental Medicine is appropriate, to deal with it, or be willing to refer appropriate patients to other physicians who have this training.

Associations

The American Academy of Environmental Medicine

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Wichita, Kansas 67207

Phone: 316-684-5500

Fax: 316-684-5709

E-mail address: centraloffice@aaem.com

Web Site: <http://www.aaem.com>

President, ABEM/IBEM

American and International Boards of Environmental Medicine

65 Wehrle Drive

Buffalo, NY 14225

Phone: 716-837-1380

Fax: 716-833-2244

Suggested Reading and References

Each of the following selections and References below has been chosen because it provides a comprehensive review of its topic(s) and a significant compilation of literature sources supporting different aspects of the discipline of Environmental Medicine:

Ashford, Nicholas A., Ph.D., J.D. and Miller, Claudia S., M.D., M.S. Chemical Exposures: Low Levels and High Stakes. 2nd Edition. Van Nostrand Reinhold, New York, New York. 1998.

An up to date, balanced, and superbly referenced review of the controversial topic of Multiple Chemical Sensitivities

Beasley, Joseph D., M.D., and Swift, Jerry, M.A. The Kellogg Report: The Impact of Nutrition, Environment, and Lifestyle on the Health of Americans. 1989. The Institute of Health Policy and Practice, The Bard College Center. Annandale-on-Hudson, New York 12504.

A comprehensive and eloquent treatise on the value of Preventive Medicine concepts

Bertalanffy, Ludwig Von. "The Theory of Open Systems in Physics and Biology", Science, vol. 111, pp 23-29, 1950.

Brostoff, J., Challacombe, S.J. Food Allergy and Intolerance. Bailliere Tindall, Philadelphia, 1987.

Excellent chapters on treatment strategies for food-related illnesses

Capra, Fritjof. The Web of Life. Anchor Books/Doubleday, New York, 1996.

An erudite dissertation setting forth a new scientific language to describe the interrelationships and interdependencies of biological, psychological, social, and cultural phenomena - the "web of life". A grand overview of the Big Picture of Life.

Dickie, Lawrence D., Editor. Clinical Ecology. Charles C. Thomas Publishers, Springfield, Illinois. 1976.

The original physician textbook containing AAEM's initial concepts on Environmental Medicine. Still an invaluable source of clinical experience although the name "Clinical Ecology" was dropped many years ago.

Effective Medicine In Clinical Practice. The British Society For Allergy and Environmental Medicine and The British Society For Nutritional Medicine Subcommittee on Allergy Practice. 1997. Obtain from the BSAENM, P.O. Box 28, Totton, Southampton SO40 2ZA, England. Fax number from the USA: 011-44-1703-813912. Cost: £ 60.00

This text of twenty superbly referenced chapters presents a current comprehensive overview of the practices of Environmental medicine as endorsed by the AAEM and BSAENM.

Pischinger, Alfred Matrix and Matrix Regulation: Basis For A Holistic Theory In Medicine. (Edited by Prof. Hartmut Heine, Ph.D.) Haug International, Brussels, Belgium. 1991 (English Edition).

A superb discussion on the ground substance regulation system as the molecular level basis for the biological phenomena of the "web of life". Discusses additional valuable medical strategies that arise when adding the concepts of ground substance matrix regulation to our understanding of health and illness.

Randolph, Theron G. Human Ecology and Susceptibility to the Chemical Environment, Charles C. Thomas, Springfield, IL. 1962

The seminal book bringing together for the first time the concepts of the potential role of chemical sensitivity in many chronic illnesses, written by the Father of Environmental Medicine.

Rea, William J. Chemical Sensitivity: Vols I-IV. CRC Press, Inc., 2000 Corporate Blvd., Boca Raton, Florida 33431. 1992, 1994, 1995, 1996.

Though focusing on the topic of chemical sensitivities, these four volumes are the Magnum Opus for the entire field of Environmental Medicine as endorsed by the Academy of Environmental Medicine and are must reading for all serious students and practitioners of this approach to medical care. Contains several thousand medical references.

Selye, Hans. "The General Adaptation Syndrome and the Diseases of Adaptation", *Journal of Allergy* (1946) 17:231-247, 289-323, 358-398.